

Rare condition implicated in pregnant women infected with malaria

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A passing remark launched the project that will be described at the Experimental Biology 2013 conference in Boston on Monday. A poster, presented by undergraduate Ashley McMichael from Albany State University, has preliminary data that hint that there is an association between a rare pregnancy condition and malaria.

The remark that launched the project was made by a [collaborator](#) of Julie Moore, a malaria expert at the University of Georgia. Moore was visiting her collaborator, pediatric pathologist Carlos Abramowsky at Children's Healthcare of Atlanta (affiliated with Emory University), armed with placental tissue slides collected from women living in western Kenya, a region where malaria is rampant. While viewing the slides, Moore recalls Abramowsky commenting, "Wow, this is a really interesting case of chorangiosis." And her reaction was, "Oh, what is chorangiosis?"

Chorangiosis is a rare condition in pregnant women who experience low blood-oxygen levels. The low oxygen levels can be brought on by illnesses, smoking or living at high altitudes. The low oxygen levels in the mother's blood leaves the fetus demanding better access to oxygen so the [placenta](#) swings into action by forming more blood vessels. But babies born with a placenta exhibiting chorangiosis have a [high risk](#) for [low birth weight](#) and other complications. There aren't any methods available to test for chorangiosis so clinicians have no way of knowing ahead of time if a woman or her [fetus](#) is in trouble.

Moore read up on chorangiosis. Then "I sat down with more tissue sections and realized that there were quite a few more cases of this," she says. Moore found the connection between chorangiosis and malaria tantalizing. The effects of malaria on the placenta have been "studied by [pathologists](#) since the early 20th century," she says. But, she adds, no one had ever mentioned seeing chorangiosis in pregnant women infected with malaria.

Over the decades, research into malaria in pregnant women has shown that the placenta is affected during the disease. Plasmodium falciparum is the parasite responsible for much of the malaria cases in Africa. One of the things the parasite does is hijack the red blood cells and export some of its own proteins onto the surface of the cells to make them stickier. The sticky cells cling onto blood vessels. The parasite does this to avoid getting cleared out in the spleen, whose function is to get rid of abnormal blood cells. But in the case of the [pregnant women](#), the placenta becomes another spot where the parasite-modified blood cells stick like insects to flypaper.

Moore was interested in seeing if the accumulation of the parasite-infected [blood cells](#) in the placenta triggered chorangiosis. The timing was such that McMichael was about to start a summer rotation in Moore's lab through an undergraduate education program funded by the National Science Foundation. So Moore tasked McMichael and a technician, Samantha Burton, to see if blood vessel growth in the placenta could be observed in women who were infected with malaria. McMichael and Burton developed a painstaking microscopy assay that allowed them to score how many fetal blood vessels they saw in each placenta sample.

Although the data are preliminary and yet to undergo peer review, Moore says that they have seen a statistically significant increase in the number of blood vessels in the placenta of women who had full-blown

malaria during the late stages of the pregnancy compared with those women who either were not infected or had an infection earlier in the pregnancy. "We are convinced that we are seeing an association between an active malarial infection and enhancement of [blood vessels](#)," says Moore.

McMichael will present the team's findings at 12:25 Monday, April 22, at the annual meeting of the American Society for Biochemistry and Molecular Biology, which is being held in conjunction with the EB2013 conference.

Moore explains that the ultimate goal is to understand the molecular mechanisms involved so that researchers can develop ways to diagnose chorangiosis and other indicators of placental and fetal distress in pregnant, [malaria](#)-infected women. Moore says, "We have to understand the pathologies before we can figure out novel ways of testing for them."

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